

ACTIVITIES:

1. Pre/Post Assessment
Student worksheet to assess the student's prior knowledge of the Sun and sunspots.
2. Background information on the Sun and sunspots
Read and discuss the NASA booklet Our Very Own Star: The Sun listed in the Internet Guide. See Internet sites #1, 5, 10, 11, 12, 14, 15, and 16, page 22.
3. What is the Sun?
Student worksheet to review basic facts about the Sun—its type, shape, distance, and size.
4. Helpful and Harmful
Student worksheet to discuss the helpful and harmful effects of the Sun.
5. Making a Homemade Sunspot Viewer
Teacher worksheet that gives directions on how to assemble and use the sunspot viewer. The class needs to complete this activity with teacher direction. Teacher should then save the tracing sheets in order to complete the sunspot viewer review.
6. Sunspot Viewer Review
This is a teacher-led discussion of the tracings of the Sun and the sunspots. See Internet site #9.
7. Sunspot Flip Book
The teacher should precut the Sun pictures and the students could then assemble the booklet themselves or just lay them in numerical order on the table. See Internet site #3.
8. Sunspot Flip Book Journal
This worksheet could be used by the teacher to lead a class discussion of the results from the Sun and sunspot drawings.
9. Sunspot Numbers
Student worksheet that demonstrates the 11-year cycle of sunspots. For the younger students enlarge this chart and data table and complete this activity with the whole class. Individual students could then come to the board and add the correct data to the chart.

Name _____

PRE/POST ASSESSMENT ACTIVITY

Draw a picture to show your answer.

1. What do you think the Sun looks like?

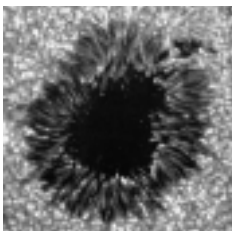


2. How does the Earth revolve around the Sun?



Fill in the blanks with a yes or no.

3. The Sun is shaped like a square.
4. The Sun is solid.
5. The Sun has spots.
6. The Sun gives us heat and light.
7. The Sun causes day and night.
8. The Sun is our closest star.
9. You can study the Sun and sunspots with a telescope.

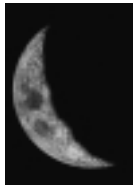


Name _____

WHAT IS THE SUN?

Circle the correct answer.

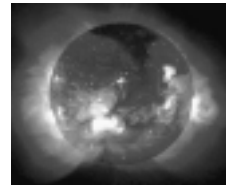
1. What is the Sun?



a moon

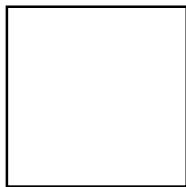


a planet



a star

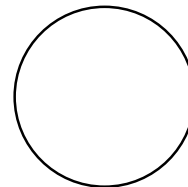
2. What is the Sun shaped like?



a square



a ball



a circle

Fill in the blank with the underlined words.

3. Is the Sun the star closest to the Earth or farthest from the Earth?

The Sun is the star _____ the Earth.

4. Is the Sun bigger than or smaller than the Earth?

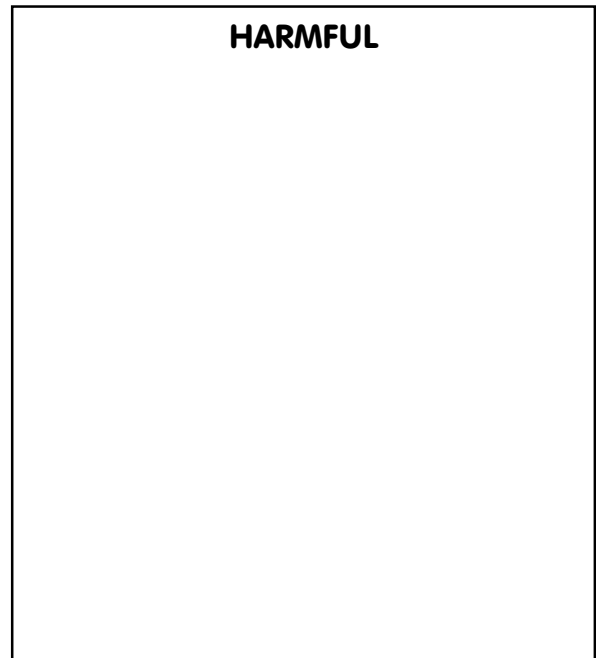
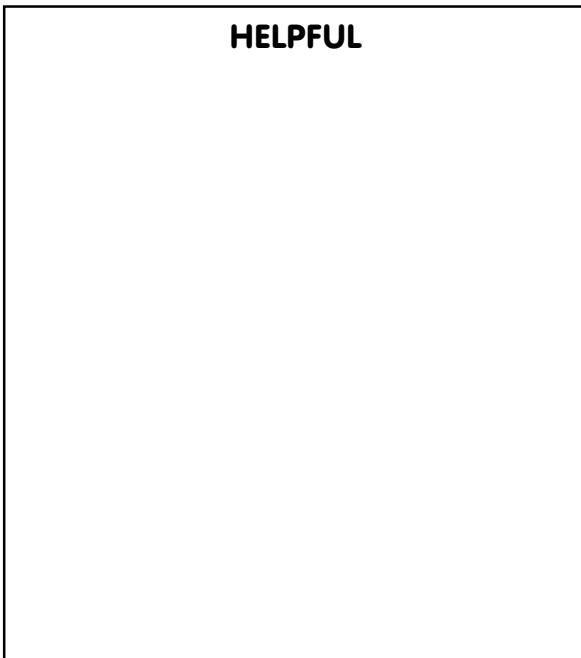
The Sun is _____ the Earth.

• • • SUNSPOTS

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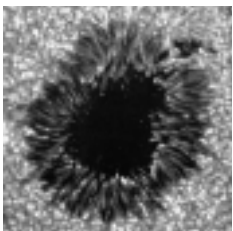
HELPFUL AND HARMFUL

Draw one picture of how the Sun could be helpful and one picture of how the Sun could be harmful. Then fill in the blanks at the bottom of the page describing your pictures.



The Sun is helpful because

The Sun is harmful because



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Name _____

MAKING A HOMEMADE SUNSPOT VIEWER

MATERIALS NEEDED:

Telescope
12-inch square piece of cardboard
Pencil/scissors/tape
White poster board
Building, tree, or adjustable music stand
Tracing paper



WARNING!!! It is never safe to look directly at the Sun because the Sun's rays can damage your eyes. It is safe to study the Sun's surface if you use a telescope to *project* the Sun's image onto a piece of paper.

PROCEDURE:

1. Set up a telescope *as if* you were looking at the Sun.
2. Cut a small hole in the center of the 12-inch square piece of cardboard.
3. Tape the cardboard with the hole in the center onto the large lens of the telescope. This cardboard serves 2 purposes. First, the outline of the cardboard will cast a shadow onto the second piece of paper which will make it easier to see the Sun's image. Second, the hole in the center will focus the image of the Sun on the second piece of paper.
4. Tack a piece of white poster board to a building or tree. If none are available, use an adjustable music stand. Focus the image of the Sun onto the piece of white poster board.
5. If the distance and focus are correct, on the poster board you should see a circle of light (the Sun's image) that is brighter at the center and darker around the edges. Inside the circle you should see some small dark spots which are sunspots. Trace the Sun and any sunspots that you see on the tracing paper.
6. Trace the Sun and its sunspots every day for 10 days if possible, weather permitting. Be sure to date each paper. Try to trace the Sun at the same time each day. Label your dots A, B, C, etc., to show their movement.

RESULTS:

When the distance and focus are correct, you should expect to see a circle of light (the Sun), which is brightest at the center and darker around the edges. Inside the circle, generally toward the middle of the Sun, you will see small black dots; these are sunspots!

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SUNSPOT VIEWER REVIEW

Your class made many drawings of the Sun and the sunspots using the telescope. Lay your drawings on the floor or on a table. Arrange them in the same order they were made. Answer the following questions about your observations.

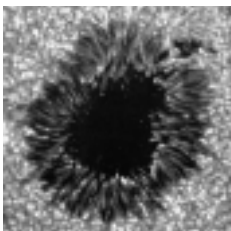
1. Does the Sun appear to change shape? What shape is it?

2. Do the sunspots appear to be moving?

3. Which direction are the sunspots moving—horizontal (across) or vertical (up and down)?

4. If the sunspots continue to follow the same pattern, draw what you think the next Sun and sunspots would look like.

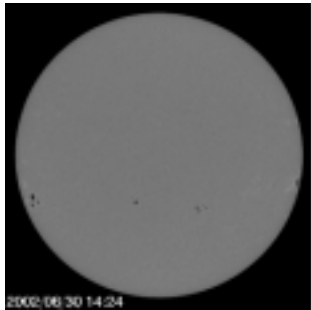
5. Are all the sunspots the same shape? The same size?



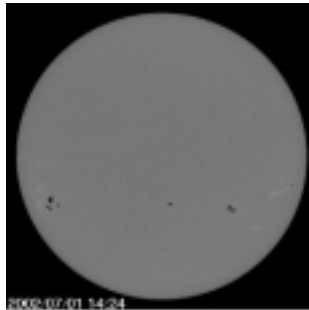
Name _____

SUNSPOT FLIP BOOK

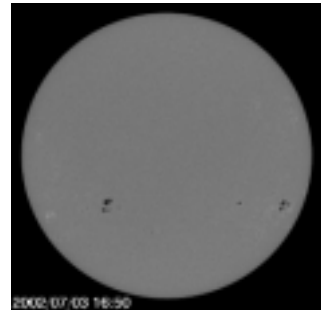
Cut out each picture. Arrange the pictures in order on top of each other. Staple into a flip book.



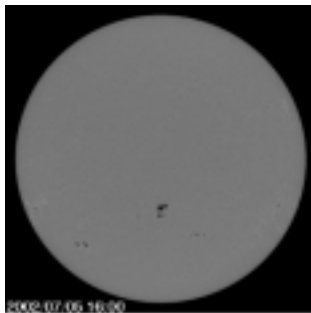
Picture 1



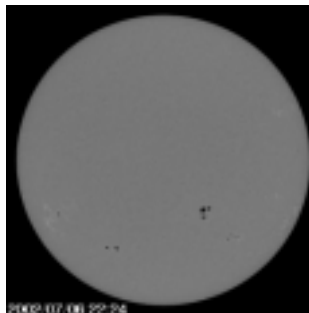
Picture 2



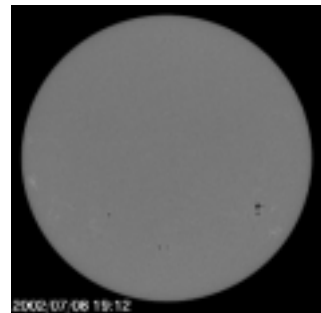
Picture 3



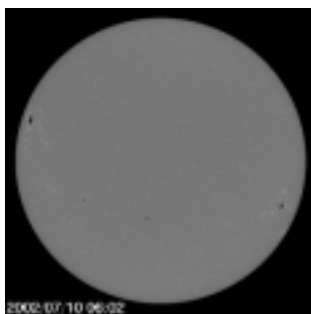
Picture 4



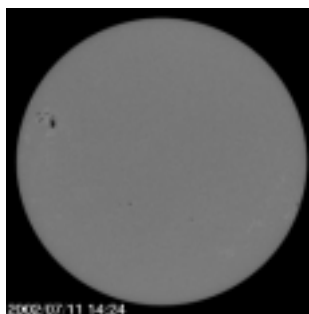
Picture 5



Picture 6



Picture 7



Picture 8



Picture 9

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SUNSPOT FLIP BOOK JOURNAL

After making your sunspot flip book, flip the pages quickly. Do this several times. Observe the pictures of the Sun and the sunspots. Answer the following questions about your observations.

1. Does the Sun appear to change shape? What shape is it?

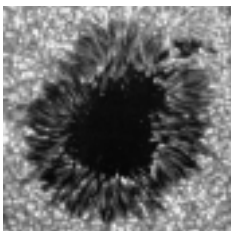
2. Do the sunspots appear to be moving?

3. Which direction are the sunspots moving—horizontal (across) or vertical (up and down)?

4. If the sunspots continue to follow the same pattern, draw what you think the next Sun and sunspots would look like.

5. Are all the sunspots the same shape? The same size?


6. Were any of your answers the same for the drawings that you made with the telescope and your answers using the flipbook? Why or why not?



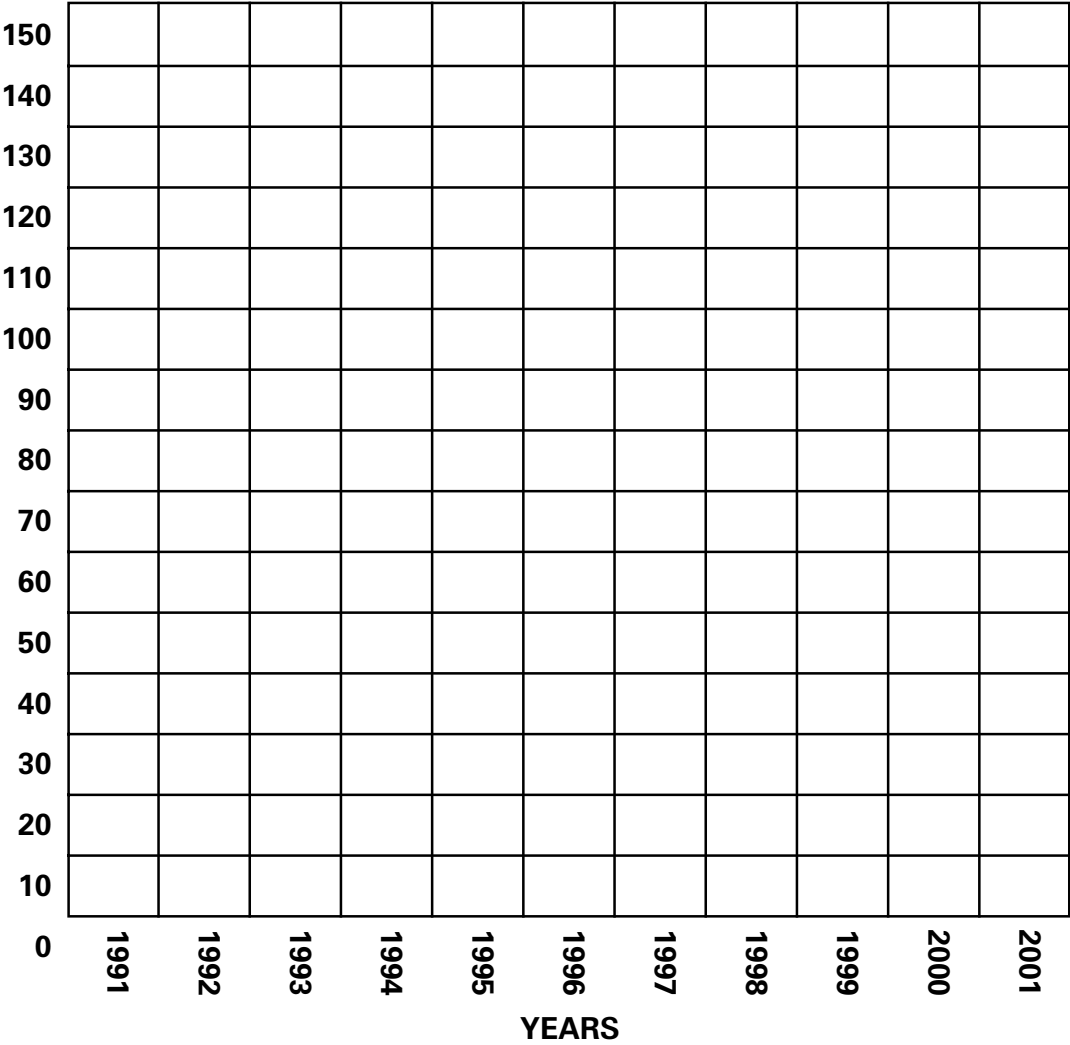
Name _____

SUNSPOT NUMBERS

Astronomers have found out that the number of sunspots increases and decreases every 11 years. Make a pictograph of the number of sunspots seen for each of the years listed below.

Draw a  for every 10 sunspots.

1991-144 sunspots	1995-10 sunspots	1999-84 sunspots
1992-82 sunspots	1996-13 sunspots	2000-104 sunspots
1993-48 sunspots	1997-41 sunspots	2001-132 sunspots
1994-26 sunspots	1998-81 sunspots	



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